DOCUMENT RESUME

ED 264 392 CE 043 023

AUTHOR Tesolowski, Dennis G.; Roth, Gene L.
TITLE Identification, Verification, and Importance of Competencies for Applying the Microcomputer in Vocational Education.
PUB DATE Dec 85
NOTE 23p.; Paper presented at the American Vocational Association Convention (Atlanta, GA, December 6-10, 1985).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Classroom Techniques; *Computer Assisted Instruction; Computer Literacy; *Computer Managed Instruction; *Microcomputers; Postsecondary Education; Secondary Education; *Teaching Skills; Vocational Education; *Vocational Education Teachers

ABSTRACT

A three-phase investigation served to identify, verify, and determine the importance of the competencies, and the categories within which they are clustered, on the Vocational Teacher Competency Profile for Microcomputer Applications. The 47 competencies and 5 categories were identified through a DACUM (Developing A Curriculum) activity during Phase I. The content of these categories and competencies was scrutinized, refined, and verified by vocational educators, teacher educators, and state staff members in Phase II. A national survey was conducted in Phase III addressing vocational educators nationwide who were expert in using the microcomputer in their respective disciplines. Ninety-seven respondents (72%) assessed the importance ratings for each competency and category on a five-point Likert-type scale. The ranges of mean ratings for the categories and competencies were, respectively, 3.74 to 4.18 and 3.38 to 4.61. These ratings documented that the level of importance of the competencies and their respective categories was in the above average to extremely important range. (Appendixes include the mean ratings and rank-ordered listing of competencies.) (YLB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED264392

Identification, Verification, and Importance of Competencies for Applying the Microcomputer in Vocational Education

Dennis G. Tesolowski

Clemson University

Gene L. Roth

Northern Illinois University

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

✓ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

D Tesolowski

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

A Paper Presented

at the

American Vocational Association Annual Convention

Atlanta, Georgia

December 6-10, 1985

CE043073

BEST COPY AVAILABLE

Abstract

This three-phase investigation served to identify, verify, and determine the importance of competencies and their respective categories, which will assist vocational educators in applying microcomputers in their programs. Five categories and 47 competencies were identified through a DACUM activity during Phase I of the study. The content of these categories and competencies was scrutinized and refined by vocational educators, teacher educators, and state staff members in Phase II, which was the primary aspect of the verification strategy. A national survey was conducted in Phase III of the study. Ninety-seven (72%) respondents rated the overall average importance of each competency and category as 3.99 on a 5-point Likert-type scale. The ranges of mean ratings for the categories and competencies were respectively 3.74 to 4.18 and 3.38 to 4.61. These ratings documented that the level of importance of the competencies and their respective categories was in the above average to extremely important range.

Identification, Verification, and Importance of Competencies for Applying the Microcomputer in Vocational Education

Historically, vocationally instructors have had to cope with the problem of keeping pace with technology. Preparing students for a workplace that is continually changing is a constant reminder to vocational teachers that they do not have the luxury of resting on previously learned work skills and knowledges. Vocational educators must keep abreast of contemporary developments within their vocational area of expertise (Skinkle, 1981).

This concern for technical updating is not limited to industrial applications of technology (Roth & Tesolowski, 1985, October). In addition to concerns about preparing students for a changing world of work, vocational teachers must contend with the application of new instructional developments. Educators could be experiencing the most significant technological change in the history of education. The microcomputer has created the greatest challenge ever for vocational instructors. The rapid influx of microcomputers into vocational classrooms and laboratories has caught many vocational educators unprepared to effectively utilize this contemporary instructonal technology.

As educational systems continue to acquire computer technology, many vocational instructors are saying, or at least thinking, "Where do we start with these machines?" Microcomputers are often purchased for vocational programs which are staffed by personnel that have not been appropriately trained in the technology. These vocational instructors may have been trained in the era before computers. Subsequently, their knowledge of computer hardware and software may be limited. This unfortunate situation is often all too real. A potential resulting danger is that the microcomputer, a technological device that holds unlimited promise for education, could be misused or not used at all simply because of a lack of adequate support for instructors at the grassroots level (Pratscher, 1983, April/May).

Vocational teachers are currently faced with the problem of how to apply computer technology in their classrooms and laboratories (Roth & Tesolowski, 1985). A major part of this problem is not so much a function of using computer systems, but how to apply them in an educational setting. In conjunction with these issues, this investigation, which was jointly supported by the Illinois State Board of Education, Department of Adult, Vocational and Technical Education and the Idaho State Board of Vocational Education, Division of Vocational Education, served to identify, verify, and determine the importance of competencies associated with applying microcomputers in vocational programs (Roth & Tesolowski, 1984; Roth, Tesolowski, Rankin, & Blackman, 1984, April).

Competency Identification Techniques

The overall need for an objective base of performance requirements or competencies for vocational teachers has been established (Burrow & Groneman, 1976, 1978; Potter, 1973). Potter indicated that performance or competency-based education is dependent upon the assumption that a causal relationship exists between teacher behavior and specifically identified outcomes.

Some early competency identification studies used the critical incident technique, panels of experts, and questionnaires (Kessell, 1957; Samson, 1964; Walsh, 1958). In a study by Crawford (1967), technical competencies were identified through interviews with workers and supervisors and then evaluated by teacher educators.

A comprehensive competency identification and validation study was conducted by Cotrell and others (1971) at the National Center for Research in Vocational Education. The Cotrell study used occupational analysis to identify pedagogical functions of vocational teachers. These competencies were then expanded and verified through a task force evaluation and a critical incident survey. These 384 statements were refined through introspection and interviews and the resulting 100 were clustered in the 10 major components of the

vocational teacher competency profile (Performance Based Curricula Program, 1975). The multi-step procedure used in the Cotrell study has been widely accepted in vocational education at the national level.

The DACUM (Developing A CurriculUM) process (Adams, 1975) was utilized in this investigation to identify competencies that are needed by vocational educators to apply microcomputers in their programs. DACUM was originally used by the Experimental Projects Branch, Canada Department of Regional Economic Expansion and the General Learning Corporation of New York. The DACUM process is based on three assumptions: (a) expert workers can define and describe their job more accurately than anyone else; (b) any job can be effectively described in terms of the tasks that successful workers in that occupation perform; and (c) all tasks, in order to be performed correctly, demand certain knowledges and attitudes from workers (Miller-Beach, 1980, April).

There were two primary reasons for utilizing the DACUM approach in this study: The process required a relatively short period of time, and it was a fairly inexpensive method for identifying categories and respective competencies needed by vocational educators to apply the microcomputer in their programs. The DACUM process has credibility and it is recognized as a procedure that can be used to identify worker tasks or competencies in a manner similar to occupational analysis (Norton, 1985).

Definition of Categories and Competencies

The terms "category" and "competency" are used synonymously with the respective terms "duty" and "task" in this study (Blank, 1982). Categories have been defined as a distinct, major work segment in an occupation. Varying numbers of sequentially-related competencies can be included within each category. Competencies have been defined as specific work-related activities. Each competency has a direct implication for the knowledge and attitude that

vocational educators must perform in completing the competency as well as its inclusive category (Andreyka, no date).

Categories and competencies which were identified through the DACUM process in this investigation were intended to demonstrate cognitive, affective, and psychomotor capabilities (Finch & Crunkilton, 1984) which are important to vocational educators in applying microcomputers in their programs. Competencies represent specific behaviors which can be integrated into a vocational educator's repertoire in order to partially fulfill the intent of each respective category.

Purpose of the Study

The purpose of this investigation was to identify, verify, and ascertain the importance of competencies, and their categorical groupings, which will assist vocational educators in applying microcomputers in their programs. Specific objectives of this project included the following:

1. Identify competencies and the categories which they are clustered within that are needed by vocational educators in order to apply microcomputers in their programs.
2. Refine and validate the competencies and categories.
3. Determine the importance of each competency and category.

Method

A three-phase research procedure was implemented to conduct this investigation. Phase I utilized the DACUM process to identify broad categories and respective competencies which are needed by vocational educators to apply the microcomputer in their programs. Phase II of this study was designed as the initial step toward verifying the content validity of the categories and competencies which were identified by the DACUM panel. Phase III of this investigation served as the final stage of the overall verification strategy (Norton, 1985) and it quantified the relative importance of the categories and competencies.

Phase I

This phase of the investigation was designed to identify the core or foundation of the categories and competencies that are pertinent to the application of microcomputers in vocational education programs.

Selection of the DACUM panel. Utilization of the DACUM process required the project to assemble a panel of 12 vocational educators. The 12 members, all from Illinois, included 4 secondary vocational instructors, 4 postsecondary vocational instructors, 3 secondary vocational administrators, and 1 representative of the Department of Adult, Vocational and Technical Education. In addition to being practitioners in the field of vocational education, these individuals had been recognized as leaders in the state of Illinois at applying microcomputers in their work. The panel members represented the following vocational areas: agricultural occupations; business, marketing and management occupations; home economics occupations; health occupations; industrial occupations; and vocational special needs education. The panel was directed by a trained DACUM facilitator, Dr. James Hamilton, Senior Research and Development Specialist, from the National Center for Research in Vocational Education (NCRVE), Columbus, Ohio.

Research procedure. Implementation of the DACUM process included the involvement of 12 vocational educators as a panel of consultants and a professional facilitator from the NCRVE. The challenge for the DACUM panel was to identify competencies specific to the application of the microcomputer in vocational education. This was accomplished through a process of competency identification and consensus decision-making.

In this professionally conducted DACUM activity, panelists were seated at three medium-sized tables. These tables were positioned in a slightly curved U-shape. All of the DACUM participants sat facing the facilitator. There was a

large blank wall directly behind the facilitator. A person who served as the recorder was seated to the side of the panelists. It was the responsibility of the facilitator to foster brainstorming discussion that would lead to the identification of broad categories of microcomputer applications for vocational teachers. As ideas evolved, the recorder documented each category title on an 8 1/2" x 11" sheet of paper and the facilitator taped them to the blank wall.

The first several hours of brainstorming in the DACUM process were argumentative, indecisive and frustrating. Panelists struggled with the creative process of identifying categories of a vocational teacher's job that were related to the application of microcomputers. There was a 3 to 4 hour adjustment period before the panelists adapted to one another and began assuming a collective role. By the afternoon of the first day, panelists were beginning to work as a cohesive unit. Through a cooperative spirit, the panel came to consensus and reduced the original 15 to 16 categories for microcomputer applications to the final 5 which are included in the profile.

Next the panelists and the facilitator used similar brainstorming techniques to generate the competencies that belonged in each category. The group came to consensus on every competency before it was included in the DACUM profile. This process served to identify the core of the 47 competencies which are clustered within the 5 broad categories.

Phase II

This phase of the study was designed to verify and essentially validate the content of the categories and competencies for applying the microcomupter in vocational programs.

Initial verification procedure. The content of the categorical titles and the competency statements was refined and verified through a formative process. After the DACUM panel generated the core of this profile, the competencies and categories were scrutinized and revised by: (a) members of the project team at

Idaho State University; (b) a group of vocational educators in Idaho; (c) consultants of the Illinois Department of Adult, Vocational and Technical Education; and (d) supervisors and staff members of the Idaho Division of Vocational Education. Information resulting from these verification procedures was used to develop the final version of the VOCATIONAL TEACHER COMPETENCY PROFILE FOR MICROCOMPUTER APPLICATIONS. The categories and their respective competencies are presented in Table 1.

Insert Table 1 about here

Phase III

This phase of the investigation was designed to conclude the verification of the content of the categories and competencies by ascertaining their relative importance.

Selection of the sample. A preliminary survey was conducted in order to identify the sample for this phase of the study. State supervisors and coordinators representing agriculture, business, home economics, marketing and distribution, trade and industrial, and health occupations education were asked to identify an educator from their home state with expertise at applying the microcomputer in their respective discipline. Respondents to this preliminary survey identified a total of 134 vocational educators that met the criteria.

The total sample surveyed in order to ascertain the importance ratings for the 47 competencies included these 134 professionals. After a second mailing to non-respondents, a total of 97 (72%) vocational educators responded.

Instrumentation. A professionally printed copy of the VOCATIONAL TEACHER COMPETENCY PROFILE FOR MICROCOMPUTER APPLICATIONS (see Table 1) was used in the mail survey to collect importance ratings for the 47 competencies. The information block in the lower right-hand corner of the profile contained explicit

instructions regarding the rating procedures which were to be used in the study.

Research procedure. The importance of the competencies was ascertained by surveying a national sample of vocational educators. Members of the sample were requested to rate each competency using the following 5-point Likert-type scale: 1 = No Importance; 2 = Minimal Importance; 3 = Average Importance; 4 = High Importance; and 5 = Extreme Importance. These ratings were tabulated, and means (see Table 1) and standard deviations (see Table 2) were calculated for each of the competencies and their respective categories. The statistical analysis of the importance ratings was conducted by using the "Subprogram

---

Insert Table 2 about here

Frequencies: One-way Frequency Distributions with Descriptive Statistics" in the STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES (SPSS) (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975).

Results

Findings of this investigation evolved as the three phases of the research procedures were implemented. During Phase I of this study a DACUM activity was conducted in order to identify broad categories and their respective competencies for applying the microcomputer in vocational education. The DACUM process resulted in the compilation of 47 competencies clustered within the following 5 categories:

A - Developing a Personal Plan for Microcomputer Competency (8 competencies);

B - Integrating Computer Based Instruction (CBI) into Vocational Curricula (8 competencies);

C - Planning, Executing, and Evaluating CBI (14 competencies);

D - Planning and Organizing the Vocational Education Learning Environment for CBI (7 competencies); and

E - Performing Classroom Management Functions with CBI (10 competencies).

Phase II of the investigation served as the primary aspect of the overall verification strategy. After the DACUM panel generated the core of this profile, the competency statements and categories were thoroughly edited by vocational teachers, teacher educators, and state consultants or supervisors. This verification process established the content validity of the categories and competencies on the profile.

The national survey conducted in Phase III of this study resulted in mean ratings and corresponding standard deviations for the competencies and their respective categories. Mean ratings for the 47 competencies range from 3.38 to 4.61. The five categories, which contain these competencies, have a range of mean ratings from 3.74 to 4.18. The overall average rating of each individual competency and each category is 3.99.

Discussion

This three-phase investigation was undertaken in order to identify, verify, and ascertain the importance of competencies, and their categorical groupings, which will assist vocational educators in applying microcomputers in their programs. The study resulted in a finalized version of a chart, entitled VOCATIONAL TEACHER COMPETENCY PROFILE FOR MICROCOMPUTER APPLICATIONS.

Based on the findings of this investigation, it is evident that every category and competency on the profile is important with regards to applying microcomputers in vocational education programs. This overall designation of importance is based on the fact that the grand mean rating for each competency and category is 3.99 out of a maximum rating of 5. This average rating of approximately four quantifiably reflects a level of high importance. Further-

more, the range of mean ratings for the competencies (3.38-4.61) and the categories (3.74-4.18) are contained within the descriptive parameters of above average to extreme importance. Norton (1985) indicated that tasks or competencies ranked as being of average importance and occasionally performed should be taught to learners aspiring to work in the selected discipline.

A review of the mean ratings indicates that the importance of the five categories can be prioritized as follows:

B - Integrating CBI into Vocational Curricula (M = 4.18);

C - Planning, Executing and Evaluating CBI (M = 4.09);

A - Developing a Personal Plan for Microcomputer Competency (M = 3.97);

D - Planning and Organizing the Vocational Education Learning Environment for CBI (M = 3.97); and

E - Performing Classroom Management Functions with CBI (M = 3.74).

Upon considering the complexity and comprehensiveness of each category, it must be noted that the differences between these categories' mean ratings are of minimal importance. The mean ratings of the individual competencies reflect a more critical value of importance.

A rank-ordered listing of the competencies is included in Table 3. This presentation of the 47 competencies depicts the relative value of each competency within the overall range (3.38-4.61) of mean ratings. The value of

---

Insert Table 3 about here

---

each of these competency statements is minimally of above average importance and maximally of extreme importance. In fact, 25 out of 47 competencies were included in the range of high (4.00) to extreme (5.00) importance. It is interesting to note the type of competencies that clustered on the highest and lowest ends of the continuum of importance.

Competencies with the Highest Degree of Importance

Competency C.4 (Select Appropriate Software for Specific Instructional Purposes) is clearly the single most important competency in the entire profile. Means included in Table 3 reflect a sizeable difference (.18) between the mean ratings for the first and second rank-ordered competency statements. Retrospectively, many professionals will probably view competency C.4 and think that it is naturally of extreme importance. However, it is doubtful that anyone could have predicted its importance in relationship to the other 46 competencies.

The next natural break of any magnitude (.09) occurs between the seventh and eighth competency statements in the rank-ordered listing. Subsequently, the seven highest ranked competencies include C.9, B.1, D.7, C.10, B.3, and B.2 in addition to C.4. Therefore, vocational educators believe that the following competencies are of utmost importance:

C.4 - Select Appropriate Software for Specific Instructional Purposes;

C.9 - Orient Students to CBI;

B.1 - Identify Job-Specific Applications of Microcomputers for inclusion in Vocational Curricula;

D.7 - Create Authorized Back-up Copies of Microcomputer Software;

C.10 - Execute CBI;

B.3 - Develop a Plan to Apply CBI to Vocational Curricula; and

B.2 - Identify Educational Applications of Microcomputers for inclusion in Vocational Curricula.

These seven competency statements appear to represent relatively pragmatic instructional behaviors and classroom procedures. Vocational educators seem to be most concerned with the actual implementation of computer based instruction.

Competencies with the Least Degree of Importance

Upon reviewing Table 3, it is evident that a relatively large break (.10) occurs between the 41st and 42nd competency statements on the rank-ordered list. Subsequently, six competencies naturally cluster at the lower end of the continuum of importance. These six competencies, beginning with the one with the least perceived importance, include C.6, E.5, E.4, E.10, E.7, and E.3. Therefore, vocational educators believe that the following competencies are of the least importance:

C.6 - Develop Software for Specific Instructional Purposes;

E.5 - Maintain Attendance Records;

E.4 - Maintain Classroom Rosters;

E.10 - Manage Vocational Student Organizations;

E.7 - Score Tests; and

E.3 - Prepare Software for Classroom Management Activities.

These six competency statements seem to indicate that vocational educators do not want to use their valuable time to develop software for instructional or classroom management activities. Furthermore, they do not appear to be concerned about performing classroom management functions through computer based instruction.

Summary and Recommendations

This three-phase study identified, verified, and demonstrated the importance of the 47 competencies, and the 5 categories that they are clustered within, on the VOCATIONAL TEACHER COMPETENCY PROFILE FOR MICROCOMPUTER APPLICATIONS. Results of this investigation documented the importance of each competency and each category on the profile.

However, it must be noted that vocational educators are more interested in applying software for instructional and classroom management activities than they are in developing software for these purposes. Furthermore, vocational

personnel do not appear to be interested in using computer based instruction for classroom management functions.

Competencies identified in this study can serve as an invaluable starting point for vocational instructors who want to integrate the microcomputer into their professional future. Vocational educators can peruse the categories, respective competencies and importance ratings which are included on the profile. Then they can integrate their observations with an examination of their own teaching situation to begin formulating an individualized plan for applying the microcomputer (Tesolowski, Wallin Roth, & Rankin, 1984).

Based upon the findings of this study, the following recommendations are warranted. This DACUM profile can be used to:

1. Assess the needs of vocational educators in regards to their mastery of competencies associated with applying microcomputers in vocational programs.

2. Develop a competency-based curriculum established upon the foundation of its competencies and categories.

3. Design competency-based instructional materials.

4. Develop competency-based software.

5. Design inservice staff development programs.

6. Develop an undergraduate-level course(s) for a preservice teacher education program.

7. Design a graduate-level course(s) for personnel involved in vocational education.

8. Monitor the progress of vocational educators who are participating in inservice staff development, undergraduate, and graduate programs.

9. Establish evaluative criteria related to the performance of vocational educators in inservice staff development, preservice, and graduate program.

References

Adams, R. E. (1975). Dacum approach to curriculum, learning and evaluation in occupational training (2nd ed.). Yarmouth, Nova Scotia: Nova Scotia New-Start.

Andreyka, R. E. (no date). Cbe: A trend for the '80s. In C. H. Bradley and J. E. Friedenberg (Eds.), Vocational-technical education for the eighties: A book of readings (pp. 101-138). Miami, FL: International Dynamics.

Blank, W. E. (1982). Handbook for developing competency-based training programs. Englewood Cliffs, NJ: Prentice-Hall.

Burrow, J. L. and Groneman, N. (1976). The purposes of and competencies developed through occupational experience for vocational education teachers. Lincoln, NE: Nebraska Research Coordinating Unit.

Burrow, J., and Groneman, N. (1978). Competencies developed through occupational experience for distributive and business and office education teachers. The Journal of Vocational Education Research, 3 (2), 7-23.

Cotrell, C. J., et al. (1971). Model curriculum for vocational and technical teacher education: Reports no. I-V. Columbus, OH: The Ohio State University, National Center for Research in Vocational Education.

Crawford, L. C. (1967). A competency pattern approach to curriculum construction in distributive teacher education. Unpublished manuscript, Virginia Polytechnic Institute and State University, Blacksburg, VA.

Finch, C. R. and Crunkilton, J. R. (1984). Curriculum development in vocational and technical education: Planning, content, and implementation (2nd ed.). Allyn and Bacon.

Kessell, R. M. (1957). The critical requirements for secondary school business teachers based on an analysis of critical incidents. Unpublished doctoral dissertation, University of Wisconsin, Madison, WI.

Miller-Beach, A., (1980, April). DACUM: Identifying competencies. School Shop, p. 63.

Nie, N. H., Hull, C. H., Jenkins, J. G., Steinbrenner, K., and Bent, D. H. (1975). Statistical package for the social sciences (2nd ed.). New York: McGraw-Hill.

Norton, R. E. (1985). Dacum handbook. Columbus, OH: The Ohio State University, National Center for Research in Vocational Education. (Leadership Training Series No. 67)

Performance Based Curricula Program. (1975). Vocational teacher competency profile. Columbus, OH: The Ohio State University, National Center for Research in Vocational Education.

Potter, D. A. (1973). A research strategy of performance-based education. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.

Pratscher, S. K. (1983, April/May). Computers in schools: A Texas perspective. Commodore: The Microcomputer Magazine, pp. 53-55.

Roth, G.L. & Tesolowski; D. G. (1984). Microcomputer competencies for vocational teachers. The Computing Teacher, 12 (3), 64-67.

Roth, G. L., & Tesolowski, D. G. (1985, October). Integrating computer technology with vocational curricula. Industrial Education, pp. 20;22-23.

Roth, G. L., & Tesolowski, D. G. (1985). Microcomputers: Mapping a future for vocational curricula. The Journal of Epsilon Pi Tau, 11 (1&2), 46-52.

Roth, G. L., Tesolowski, D. G., Rankin, R. A., & Blackman, H. S. (1984, April). Getting ready for micros. VocEd, pp. 30-31.

Samson, H. E. (1964). The critical requirements for distributive education teacher-coordinators. Unpublished doctoral dissertation, University of Minnesota, St. Paul, MN.

Skinkle, J. D. (1981). The promise and limitations of competency-based instruction. In K. B. Greenwood (Ed.), Contemporary challenges for vocational education (pp. 197-205). Arlington, VA: American Vocational Association.

Tesolowski, D. G., Wallin, C. W., Roth, G. L., & Rankin, R. A. (1984). The dynamic duo: The microcomputer and the vocational special needs teacher. The Journal for Vocational Special Needs Education, 6 (3), 17-20.

Walsh, J. P. (1958). Qualifications, preparation and competencies of trade and industrial teachers. Unpublished doctoral dissertation, George Washington University, Washington, DC.

BEST COPY AVAILABLE

Table 1

Mean Competency Ratings for Categories and Competencies on the

VOCATIONAL TEACHER COMPETENCY PROFILE FOR MICROCOMPUTER APPLICATIONS

	Category	Competencies							
A	Developing a Personal Plan for Microcomputer Competency 3.97	A.1 Define Elements of a Local Education Agency (LEA) Plan for Computer Based Instruction (CBI) 3.67	A.2 Define the Vocational Instructor's Role in the LEA Plan for CBI 4.00	A.3 Conduct a Personal Assessment of Microcomputer Competency 3.90	A.4 Set Personal Goals for Microcomputer Competency 4.11	A.5 Construct a Personal Plan for Microcomputer Competency 4.06	A.6 Implement a Personal Plan for Microcomputer Competency 4.16	A.7 Evaluate Personal Plan Based on Computer Innovations 3.87	A.8 Modify Personal Plan as Needed 3.97
B	Integrating CBI into Vocational Curricula 4.18	B.1 Identify Job-Specific Applications of Microcomputers for inclusion in Vocational Curricula 4.42	B.2 Identify Educational Applications of Microcomputers for inclusion in Vocational Curricula 4.37	B.3 Develop a Plan to Apply CBI to Vocational Curricula 4.38	B.4 Demonstrate an Awareness of Microcomputer Software for Developing Computer Based Vocational Curricula 4.22	B.5 Write Specifications for Hardware/ Software Based on Vocational Curricula Requirements 3.77	B.6 Implement a Plan to Apply CBI to Vocational Curricula 4.26	B.7 Evaluate Applications of CBI in Vocational Curricula Based on Innovation in Computer Technology & Work 3.95	B.8 Modify Applications of CBI in Vocational Curricula as Needed 4.04
C	Planning, Executing & Evaluating CBI 4.09	C.1 Differentiate Among Applications of CBI (Such as Drill & Practice, Tutorial, Simulation & Problem Solving) 3.84	C.2 Assess Students' Needs for Specific CBI Applications 4.15	C.3 Develop Lesson Plans Incorporating CBI 4.22	C.4 Select Appropriate Software for Specific Instructional Purposes 4.61	C.5 Modify Simple Software for Specific Instructional Purposes 3.71	C.6 Develop Software for Specific Instructional Purposes 3.38	C.7 Prepare Instructional Materials to Accompany Software 4.22	C.8 Modify Software Documentation for Specific Instructional Purposes 3.77
	Planning, Executing & Evaluating CBI (Con't)	C.9 Orient Students to CBI 4.43	C.10 Execute CBI 4.39	C.11 Individualize Instruction with CBI 4.17	C.12 Assess Student Microcomputer Skills 4.02	C.13 Evaluate Effectiveness of CBI Based on Student Achievement 4.21	C.14 Modify CBI as Needed 4.10		
D	Planning & Organizing the Vocational Education Learning Environment for CBI 3.97	D.1 Develop a Plan to Implement CBI in Vocational Education Learning Environments 4.11	D.2 Schedule CBI Activities 3.97	D.3 Project Resource Needs (Supplies, Materials, Equipment) for CBI 4.02	D.4 Provide Microcomputer Maintenance 3.69	D.5 Establish Microcomputer User Security 3.72	D.6 Establish Microcomputer Hardware/ Software Security 3.84	D.7 Create Authorized Back-up Copies of Microcomputer Software 4.40	
E	Performing Classroom Management Functions with CBI 3.74	E.1 Determine Classroom Management Activities to be Performed with CBI 4.13	E.2 Select Software for Classroom Management Activities 4.28	E.3 Prepare Software for Classroom Management Activities 3.57	E.4 Maintain Classroom Rosters 3.44	E.5 Maintain Attendance Records 3.39	E.6 Generate Tests 3.83	E.7 Score Tests 3.53	E.8 Record Grades or Performance Progress 3.88
	Performing Classroom Management Functions with CBI (Con't)	E.9 Maintain Inventory of Teaching Supplies, Materials & Equipment 3.91	E.10 Manage Vocational Student Organizations 3.49						

Competency Rating Scale

The relative importance of these 47 competencies was determined by surveying a national sample of 134 vocational educators. Vocational instructors included in this sample were identified as experts at applying microcomputers in their programs by their respective state supervisors. Ninety-seven (97) vocational teachers (72%) responded to this survey. The following vocational disciplines were represented by this sample: agriculture; business; home economics; marketing and distribution; trade and industrial; and health occupations education. Mean ($\bar{x}$) competency ratings were derived from respondents' ratings based on the following scale:

1 = No Importance **2 = Minimal Importance** **3 = Average Importance** **4 = High Importance** **5 = Extreme Importance**

Table 2

Standard Deviations for Categories and Competencies on the Vocational Teacher Competency Profile for Microcomputer Applications

Category A	Category B	Category C	Category D	Category E
.659	.608	.551	.655	.771
		Competencies		
A.1 = 1.028	B.1 = .788	C.1 = .858	D.1 = .900	E.1 = .909
A.2 = 1.000	B.2 = .754	C.2 = .833	D.2 = .822	E.2 = .800
A.3 = .884	B.3 = .742	C.3 = .819	D.3 = .829	E.3 = 1.189
A.4 = .815	B.4 = .819	C.4 = .622	D.4 = 1.193	E.4 = 1.136
A.5 = .801	B.5 = 1.026	C.5 = 1.000	D.5 = 1.106	E.5 = 1.178
A.6 = .850	B.6 = .768	C.6 = 1.245	D.6 = 1.121	E.6 = 1.087
A.7 = .931	B.7 = .834	C.7 = .881	D.7 = .837	E.7 = 1.208
A.8 = .940	B.8 = .853	C.8 = 1.046		E.8 = 1.102
		C.9 = .802		E.9 = .947
		C.10 = .785		E.10 = 1.081
		C.11 = .924		
		C.12 = .901		
		C.13 = .889		
		C.14 = .907		

Table 3

Rank-Ordered Listing of the 47 Competencies on the Vocational Teacher Competency Profile for Microcomputer Applications

Rank	M	Competency Code n	Competency statement
1	4.61	C.4	Select Appropriate Software for Specific Instructional Purposes
2	4.43	C.9	Orient Students to CBI
3	4.42	B.1	Identify Job-Specific Applications of Micro-computers for inclusion in Vocational Curricula
4	4.40	D.7	Create Authorized Back-up Copies of Microcomputer Software
5	4.39	C.10	Execute CBI
6	4.38	B.3	Develop a Plan to Apply CBI to Vocational Curricula
7	4.37	B.2	Identify Educational Applications of Microcomputers for inclusion in Vocational Curricula
8	4.28	E.2	Select Software for Classroom Management Activities
9	4.26	B.6	Implement a Plan to Apply CBI to Vocational Curricula
11	4.22	B.4	Demonstrate an Awareness of Microcomputer Software for Developing Computer Based Vocational Curricula
11	4.22	C.3	Develop Lesson Plans Incorporating CBI
11	4.22	C.7	Prepare Instructional Materials to Accompany Software
13	4.21	C.13	Evaluate Effectiveness of CBI Based on Student Achievement
14	4.17	C.11	Individualize Instruction with CBI
15	4.16	A.6	Implement a Personal Plan for Microcomputer Competency
16	4.15	C.2	Assess Students' Needs for Specific CBI Applications
17	4.13	E.1	Determine Classroom Management Activities to be Performed with CBI
18.5	4.11	A.4	Set Personal Goals for Microcomputer Competency
18.5	4.11	D.1	Develop a Plan to Implement CBI in Vocational Education Learning Environments
20	4.10	C.14	Modify CBI as Needed
21	4.06	A.5	Construct a Personal Plan for Microcomputer Competency
22	4.04	B.8	Modify Applications of CBI in Vocational Curricula as Needed
23.5	4.02	C.12	Assess Student Microcomputer Skills
23.5	4.02	D.3	Project Resource Needs (Supplies, Materials, Equipment for CBI)
25	4.00	A.2	Define the Vocational Instructor's Role in the LEA Plan for CBI
26.5	3.97	A.8	Modify Personal Plan as Needed
26.5	3.97	D.2	Schedule CBI Activities
28	3.95	B.7	Evaluate Applications of CBI in Vocational Curricula Based on Innovation in Computer Technology & work

Table 3 (continued)

Rank	M	Competency Code n	Competency statement
29	3.91	E.9	Maintain Inventory of Teaching Supplies, Materials & Equipment
30	3.90	A.3	Conduct a Personal Assessment of Microcomputer Competency
31	3.88	E.8	Record Grades or Performance Progress
32	3.87	A.7	Evaluate Personal Plan Based on Computer Innovations
33.5	3.84	C.1	Differentiate Among Applications of CBI (Such as Drill & Practice, Tutorial, Simulation & Problem Solving)
33.5	3.84	D.6	Establish Microcomputer Hardware/Software Security
35	3.83	E.6	Generate Tests
36.5	3.77	B.5	Write Specifications for Hardware/Software Based on Vocational Curricula Requirements
36.5	3.77	C.8	Modify Software Documentation for Specific Instructional Purposes
38	3.72	D.5	Establish Microcomputer User Security
39	3.71	C.5	Modify Simple Software for Specific Instructional Purposes
40	3.69	D.4	Provide Microcomputer Maintenance
41	3.67	A.1	Define Elements of a Local Education Agency (LEA) Plan for Computer Based Instruction (CBI)
42	3.57	E.3	Prepare Software for Classroom Management Activities
43	3.53	E.7	Score Tests
44	3.49	E.10	Manage Vocational Student Organizations
45	3.44	E.4	Maintain Classroom Rosters
46	3.39	E.5	Maintain Attendance Records
47	3.38	C.6	Develop Software for Specific Instructional Purposes